

TACTICAL REMOTE SENSOR SYSTEMS



This brief is UNCLASSIFIED in its entirety.

General Characteristics of the TRSS



- Frequency band- 138.000 Mhz to 153.000 Mhz
- Transmits VHF frequency
- Available channels (VHF)- 599
- Transmit up to 63 sensors per channel
- Operating temperatures- -30° C to +65° C

Sensors of the Ground Sensor Platoon



Encoder Transmitter Unit/ Seismic Intrusion Detector

ETU/SID

Infrared Intrusion Detector

IRID

Magnetic Intrusion Detector

MAGID

Day/Night Thermal Imager

Improved Air-Delivered Sensor

IADS

Encoder Transmitter Unit/ Seismic Intrusion Detector



ETU/SID

ETU- Radio frequency transmitting device which sends the sensor signal to the monitoring station or a retransmission device

SID- detects ground vibration caused when personnel or vehicles pass within the sensor's detection range

Detection Radius- varies with soil type and sensitivity setting on the sensor, on average it will detect personnel up to 20 meters and vehicles up to 80 meters

Power Source- 4 BA-3042/U (C-cell batteries)

Weight- 6 lbs with batteries

Overview- The seismic sensor is the base of our sensor equipment. It is essential to employ the SID because it is the sensor used in our formula to figure out vehicle or personnel, rate of speed, direction, and length of column.



Infrared Intrusion Detector



Detection Radius- up to 20 meters for personnel and 45 meters for vehicles

Power Source- ETU/SID

IRID

Weight- 1.2 lbs

Overview- The IRID is designed to confirm or deny presence of activity in an area by detecting changes in the ambient temperature caused by movement across its field of vision. It is particularly useful in counting the number of objects moving through a string due to its quick reset time and confirming direction of movement.



Magnetic Intrusion Detector

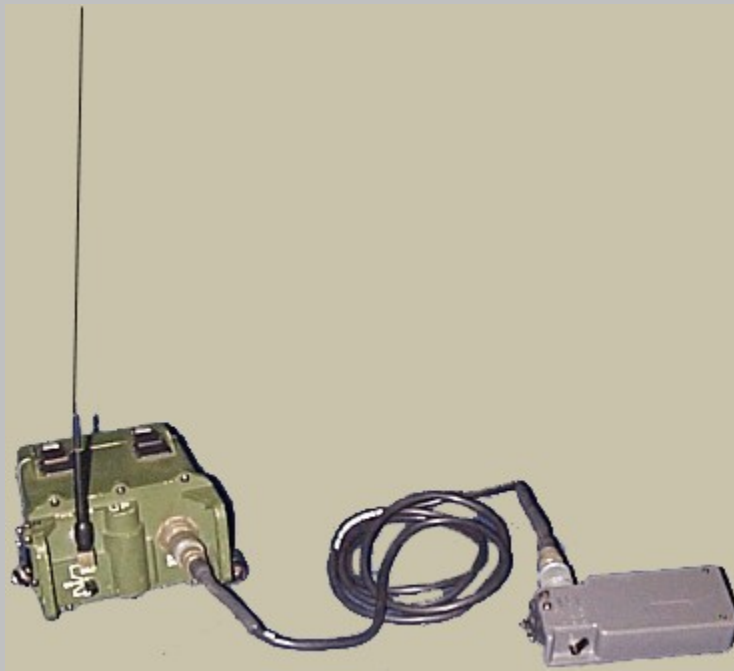


Detection Radius 3 meters for personnel and up to 25 meters for vehicles

Weight- 0.9 lbs

Power Source- ETU/SID

Overview- The MAGID is designed to primarily detect vehicles or distinguish between personnel and vehicles. They detect disturbances in a self-generated magnetic field caused by the presence of ferrous metal. They can also determine direction of movement through the magnetic field.



Day/Night Thermal Imager



Detection Radius- most effective when target is 9 meters from head

Power Source- 1 BA-5590
(lithium)

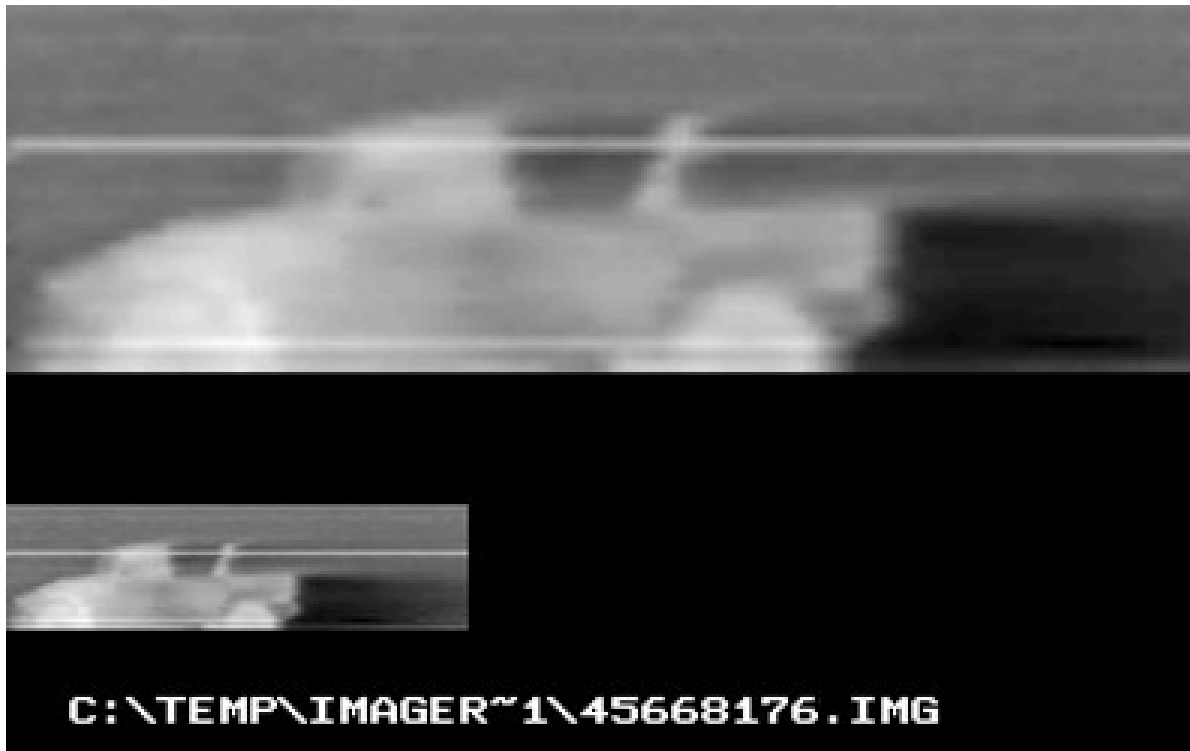
Weight- 12 lbs with
battery

Overview- The imager provides an enhanced confirmation/classification capability. The imager has an internal SID that activates the imager head when it detects vibrations from a target





Example image of a vehicle



Improved Air Delivered Sensor



Detection Radius- Dependent on type of target, can detect certain targets up to 600 meters away

Power Source- Two lithium batteries supply power for up to 14 days

Weight- 14 lbs with batteries

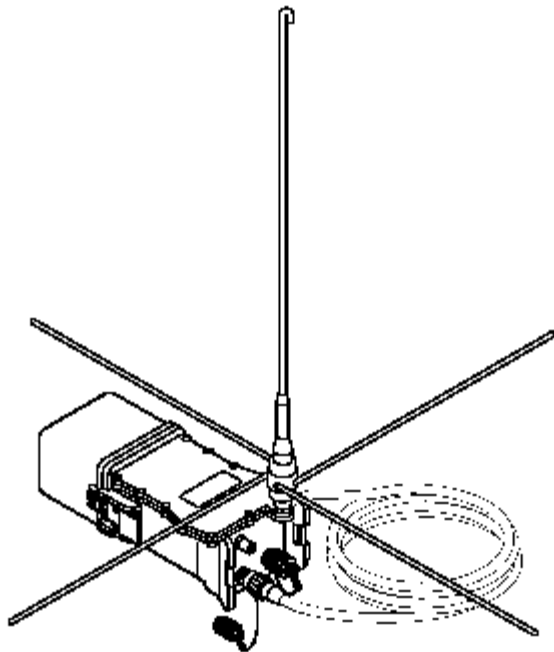
Overview- The IADS uses a combination of two sensors, it has an internal seismic sensor and an external acoustic sensor. The seismic sensor functions the same as the hand emplaced sensor, the acoustic sensor has the ability to differentiate between sounds of the environment around it. Air delivered sensors are used in situations where it would be extremely difficult to employ a land team, they are used as an alternative to hand emplaced sensors due to their limited life, and pilots susceptibility to anti aircraft fire because optimal delivery of sensor has a helicopter flying at 80 knots



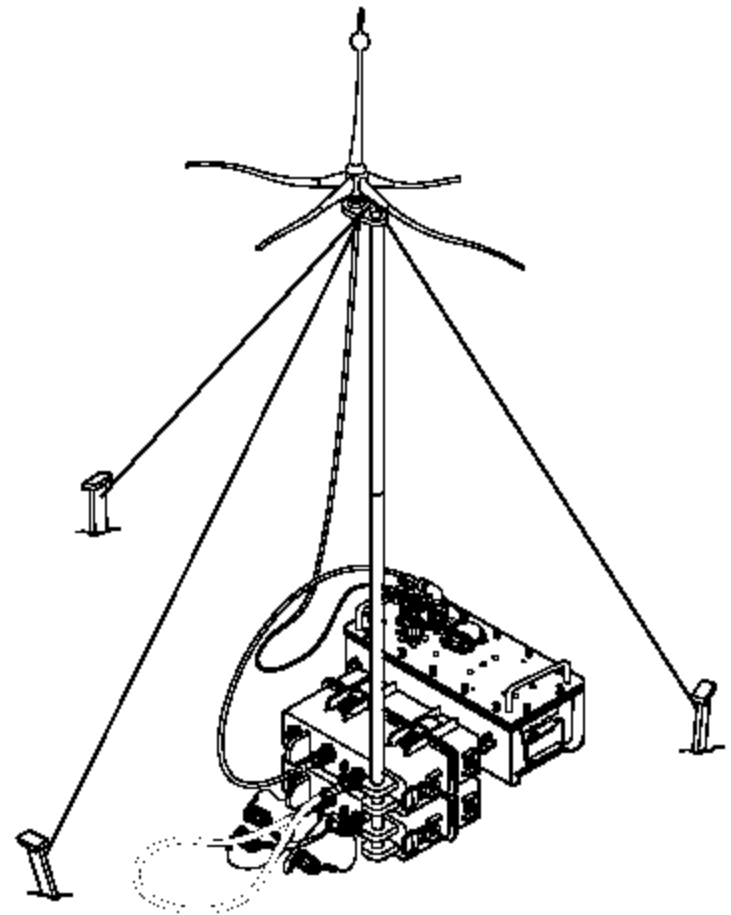
Retransmission Equipment



Radio Repeater



Relay Unit



UGSS Relay Unit

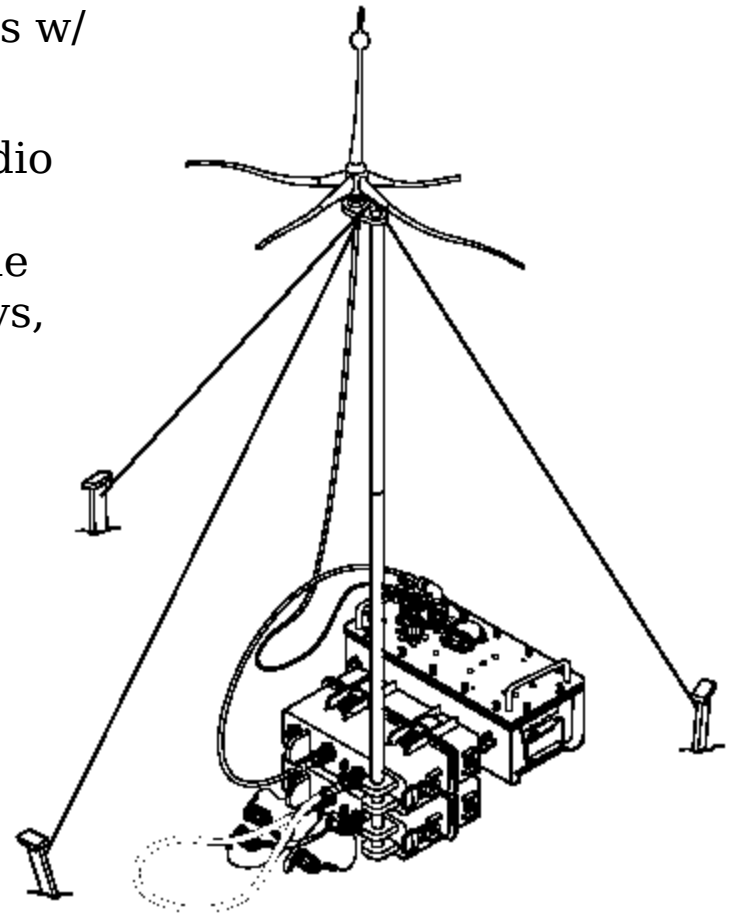


Transmission Radius- 50 miles

Power Source- 2 BA-5590's contained inside of a Battery Box (CY-8680/G)

Weight- Relay Unit-10lbs, Battery Box- 8.24 lbs w/ Batteries

Overview- The relay unit is a multiple channel retransmission antenna used to overcome radio line of sight/ distance limitations between remote sensors and monitoring sites. One battery box can give life for up to 30 days, however battery boxes can be ganged to provide for extended operational periods



Radio Repeater



Transmission Range- 6-8 miles

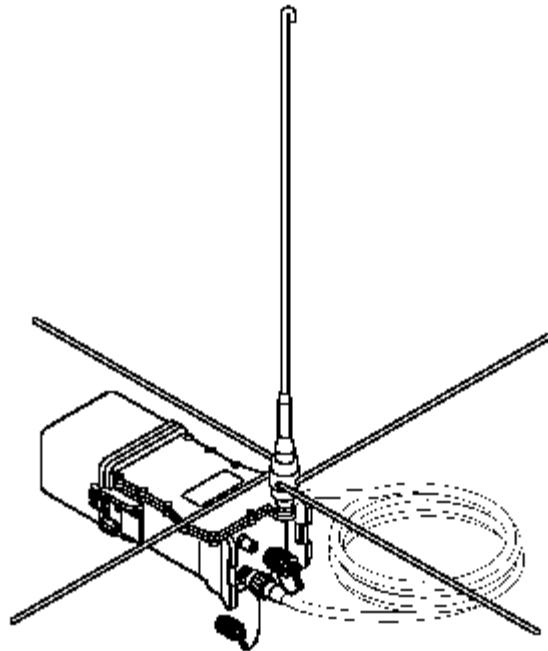
Power Source- 2 BA-

5557/U

Weight- 7.44 lbs w/

batteries

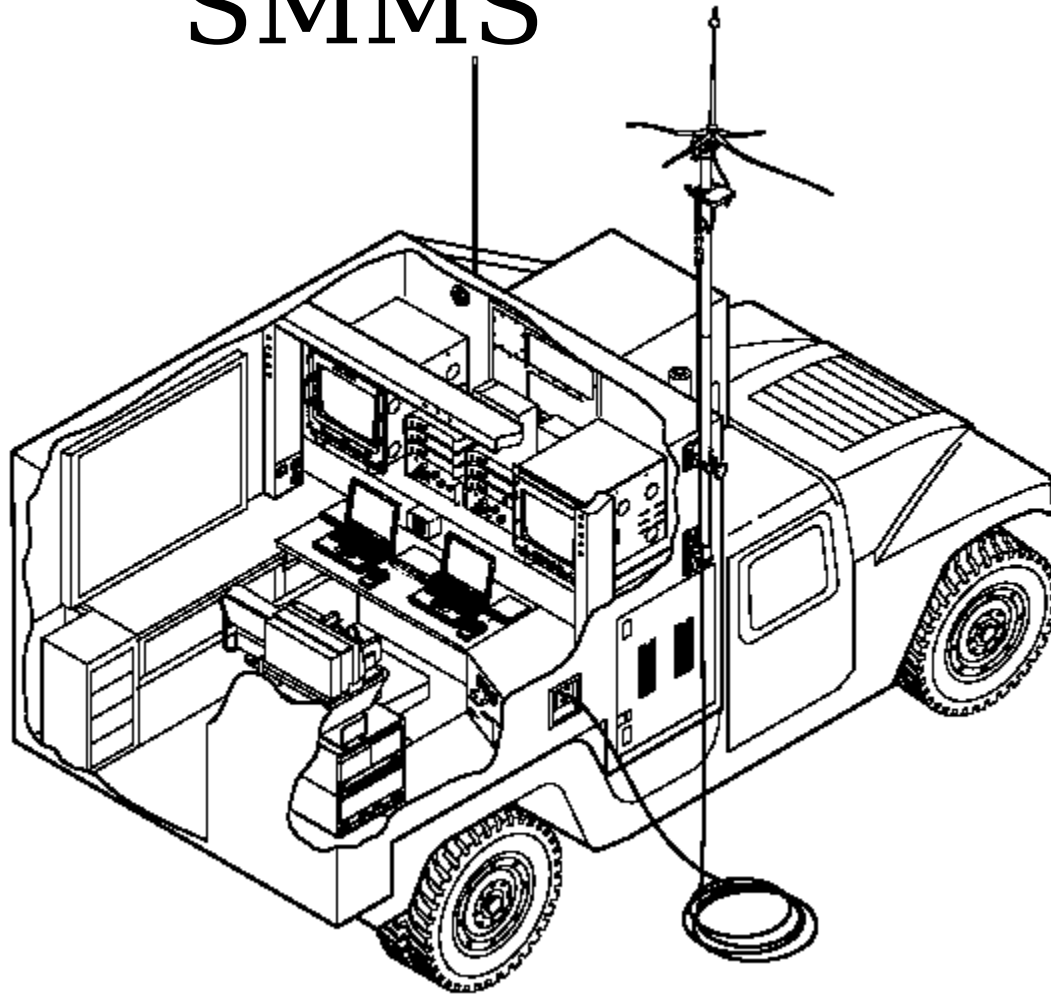
Overview- The repeater is a programmable single channel VHF radio set used to retransmit messages from field deployed sensors to either another repeater, a relay, or a sensor monitoring site .



Sensor Mobile Monitoring System



SMMS



SMMS



Components- M-1097 Heavy Variant HMMWV, Sensor Monitoring Station (SMS), Generator w/ trailer

SMS Components- 2 signal data recorders (SDR), communication equipment, environmental control unit

Power Source- 208 3 phase, 120 single phase, CY-8680/U Battery Box with BA-5590's

Weight- 7,785 including vehicle

Dimensions- Length- 180 in, Width- 85 in, Height- 104 in

Monitoring Capacity- 1008 sensors

Overview- The SMMS is a control facility which receives, stores, processes, displays, and reports sensor activity. Inside of the shelter, there is two workstations consisting of a SDR and a computer, either one of the monitoring workstations can be displaced from the shelter to provide limited stand-alone monitoring capability at remote locations. SMMS can receive messages with several different antenna configuration. Antenna selection will be based on mission considerations, but in most cases a dual band omni-directional antenna will be used mounted on the side of the vehicle, or on either a 30 foot or 50 foot antenna mast.

Signal Data Recorder SDR



Monitoring Capacity- 504 sensors

Components- Intelligence Communications Controller (ICC), Computer Unit, SDR remote kit

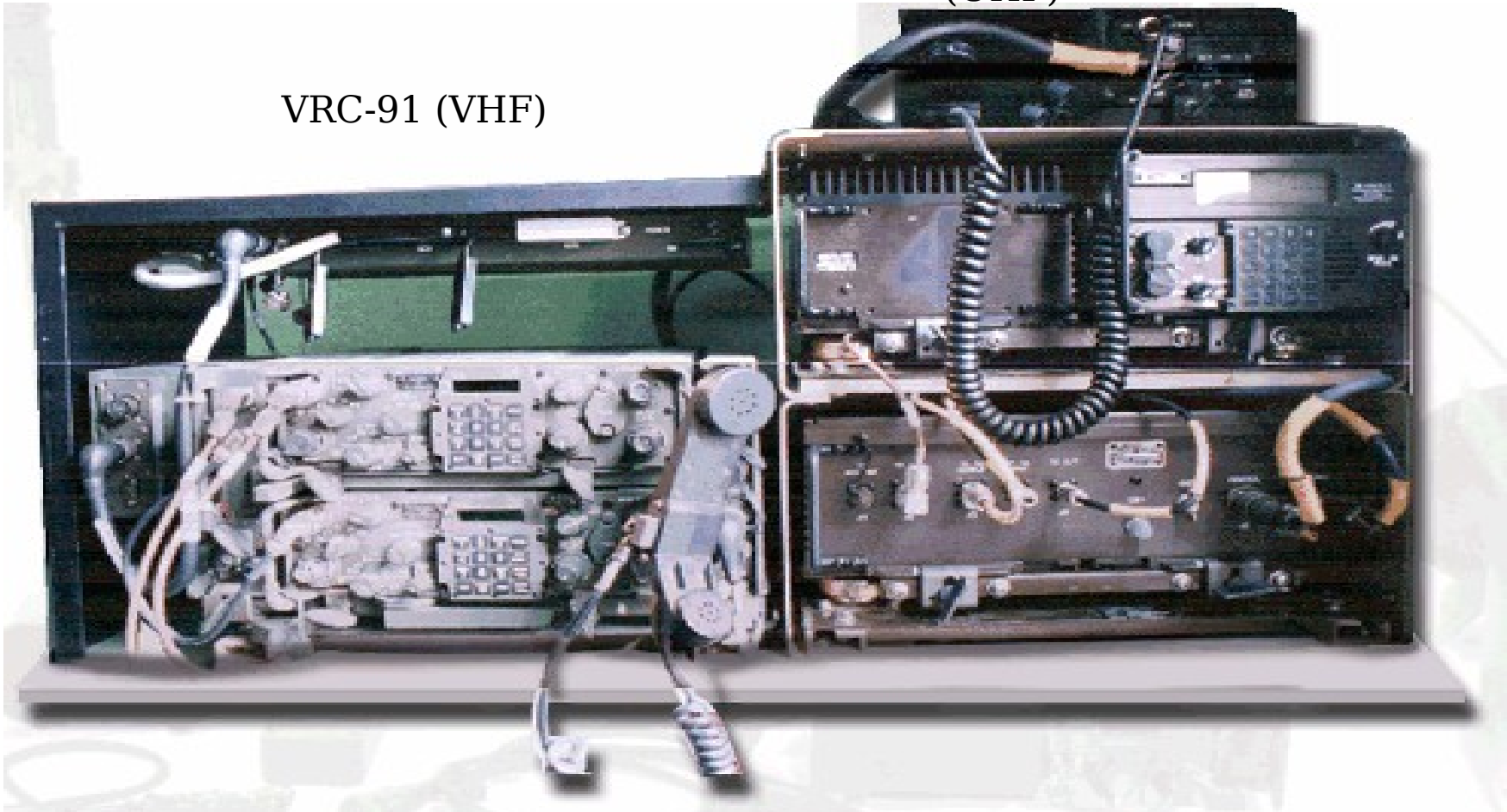


Communications Capabilities



Harris Radio
(UHF)

VRC-91 (VHF)



Sensor Employment Principles

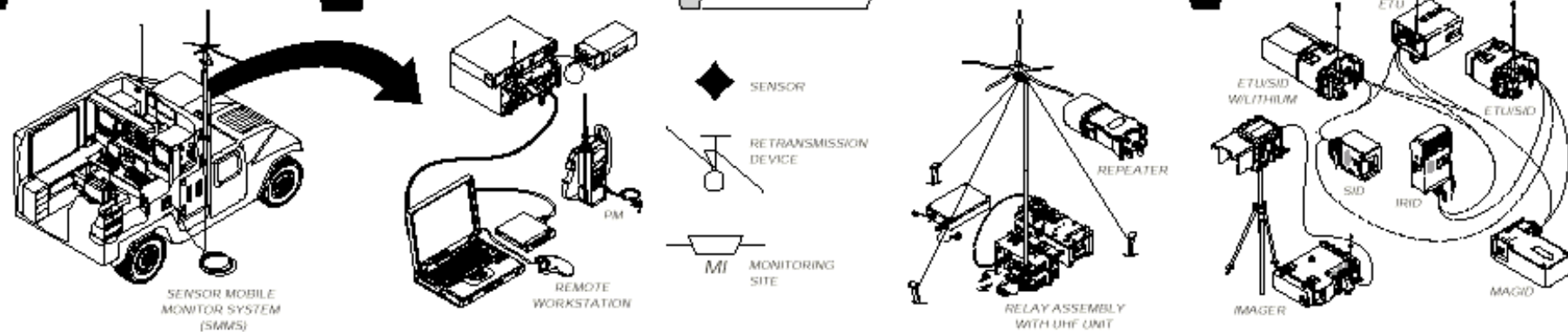
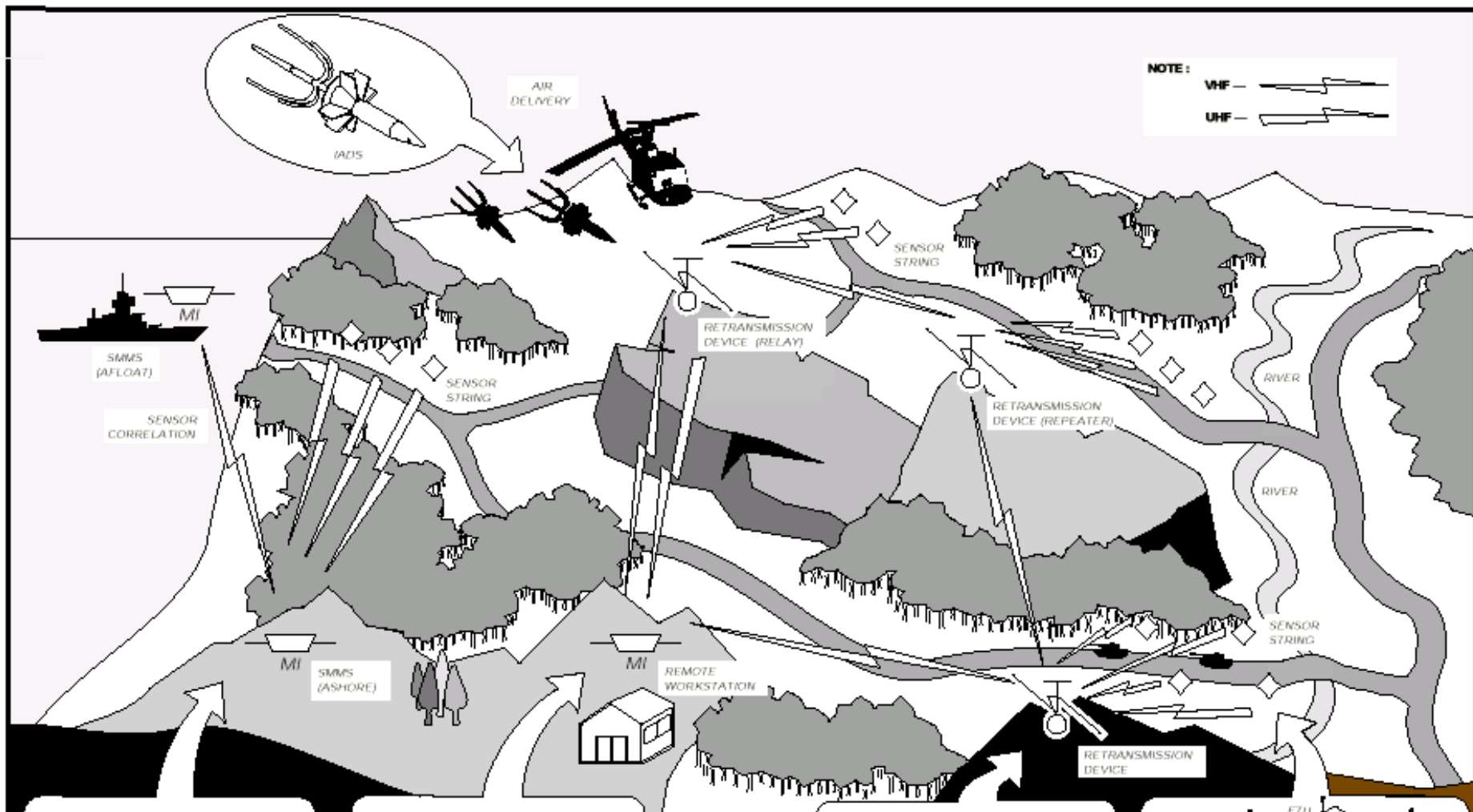


- Remote sensors can be used in almost any tactical situation. Optimal employment is in areas where major movement is restricted to a few lines of communication, and the traffic pattern of military and civilian activity can easily be discriminated. Remote sensor operations ideally support operations where the time and resources are available to develop an extensive sensor network throughout an area of operations.

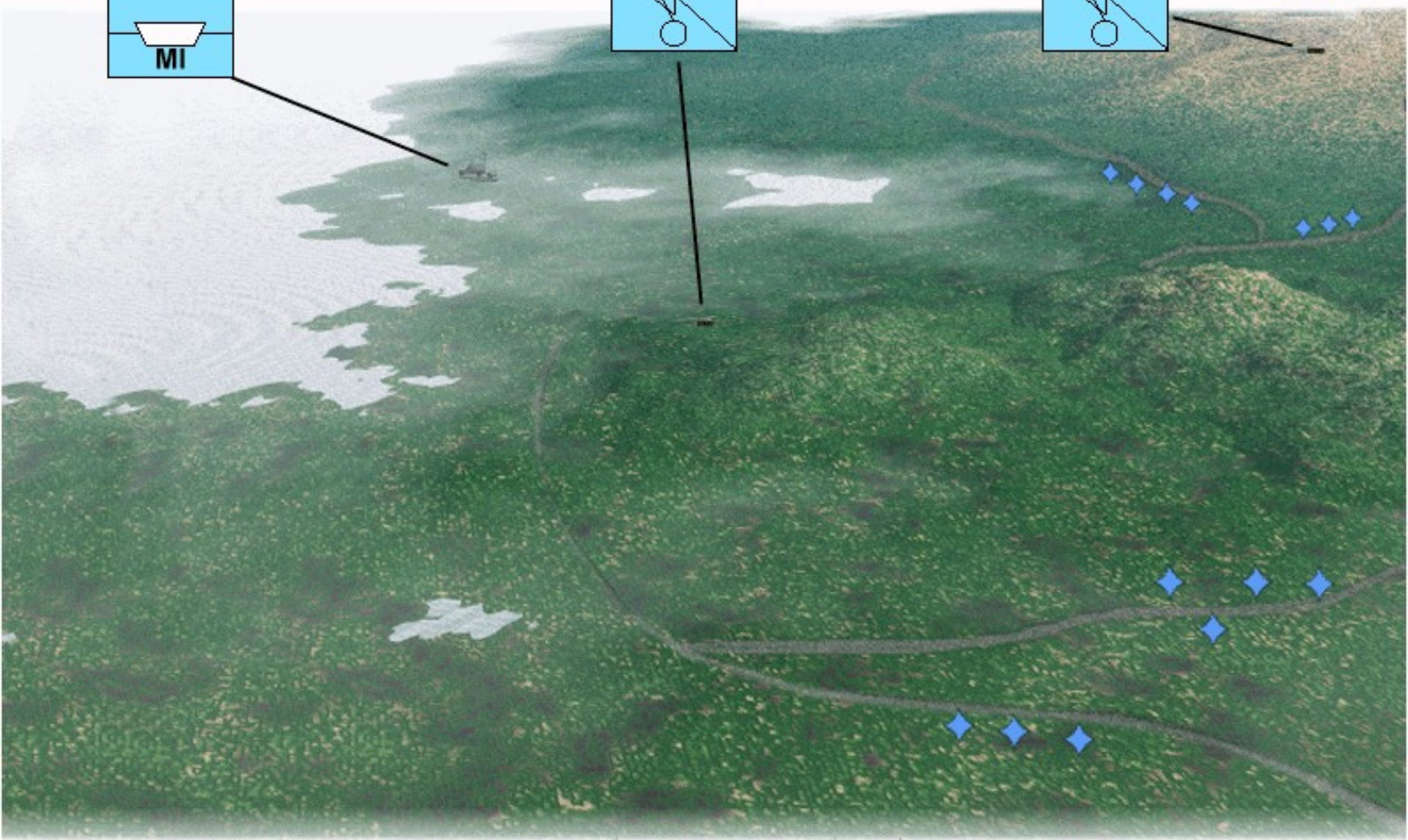
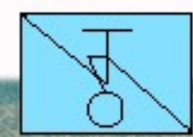
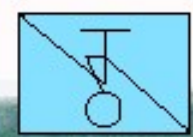
Concept of Employment

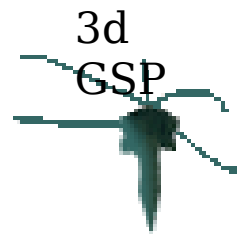


- Sensors are implanted in strings of 3 to 5 sensors per string. Whenever possible, a variety of sensors will be used within a string in order to provide maximum target discrimination data. Strings are implanted according to a coherent sensor surveillance plan, facilitating comprehensive coverage of designated surveillance sites and the general area of operations. Sensor strings are integrated with relays and monitoring sites, forming a sensor network.



Imagery of sensor network





Death by
Detection